Analysis of BellSouth's Proposal for Determining Balancing Critical Values

Submitted to Louisiana Public Service Commission (LPSC) Docket U-22252 Subdocket C

In its list of testing principles, the statistician's report *Statistical Techniques For The Analysis And Comparison Of Performance Measurement Data*[1] states that "The testing methodology should balance Type I and Type II error probabilities." In order to do this, an alternative hypothesis must be set as a reference point for balancing. Business rules should govern the choice of the alternative hypothesis, but statistical science can be used to evaluate the impact of different choices.

As part of this impact evaluation process, one can look at the testing decision rules that are implied by balancing at particular alternative hypotheses. Each proposed alternative hypothesis, in combination with the ILEC and CLEC sample sizes, leads to a balancing critical value (BCV) for a test. By looking at the range of BCVs for performance measures tests, and the corresponding Type I error probabilities,[2] we can begin to judge how the choice of an alternative hypothesis will effect the test outcome.

When the relationship between the ILEC and CLEC performance measure under the alternative hypothesis is parameterized (for means the parameter is denoted by δ [delta], for proportions by ψ [psi], and for rates by ε [epsilon]) formulae for determining BCVs can be derived. The derivations can be found in Appendix C of "Statistical Techniques For The Analysis And Comparison Of Performance Measurement Data." As was stated above, the BCV formulae not only depends upon the alternative hypothesis parameter, but also the sample sizes involved in the test.

To get an idea of how sample size affects the BCV, Figure 1 below plots the BCVs of a mean performance measure versus the CLEC sample sizes when the ILEC sample size is assumed to be large, and $\delta = 0.5$. Notice how the magnitude of the BCV increases as the CLEC sample size increases. Intuitively, small sample sizes do not provide a lot of information, so disparate treatment will be hard to detect. To compensate for this, the critical value of the test is closer to 0. On the other hand, very large samples provide a lot of information, and will detect even a tiny amount of disparity. The difference between ILEC and CLEC performance may be so small that it cannot be noticed by customers, but statistically the difference will be significant. By moving the critical value of the test further away from zero, we reduce the likelihood that a small, insignificant difference in performance is judged as disparate treatment.

---

[1] Submitted by BellSouth to the Louisiana PSC on October 27, 1999. A revised version of this report will be submitted in January 2000 and will incorporate balancing techniques for proportions and rates.

[2] The Type I error probability, α, is derived by finding the area under a standard normal curve to the left of the BCV. Since the critical value balances the error probabilities, this is also the Type II error probability, β.

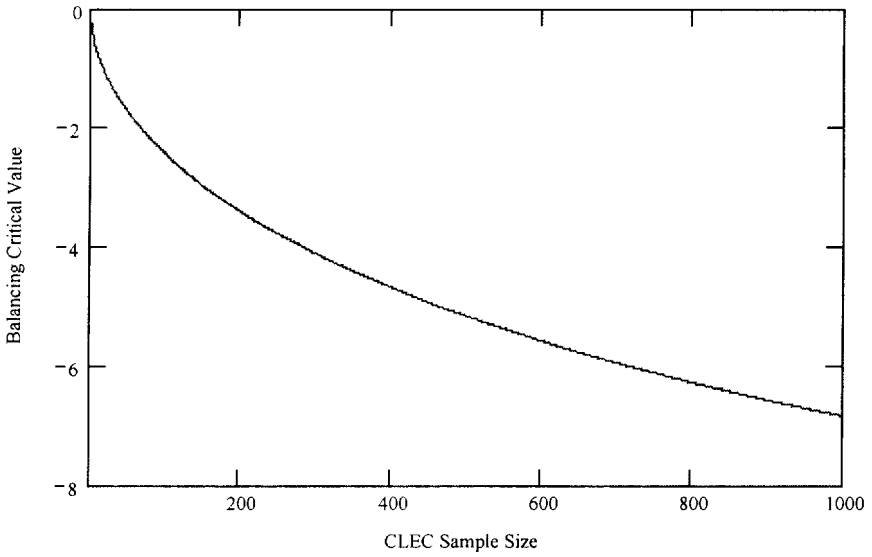


Figure 1. Relationship between CLEC sample size and balancing critical value when $\delta = 0.5$ and ILEC sample size is large.

The tables on the following pages summarize the BCVs and the Type I and II error probabilities ($\alpha = \beta$) for 5 measures in 2 different months, June 1999 and September 1999. Each month has three pages of output, corresponding to the following three "types" of performance measures: means, proportions, and rates. The mean performance measures include Order Completion Interval (OCI) and Maintenance Average Duration (MAD). The proportional measures include Percent Missed Installation Appointments (PMI) and Percent Missed Repair Appointments (PMR). Finally, there is a single rate measure, Customer Trouble Report Rate (CTRR).

The tables summarize the BCVs at both tiers of testing, both in one-to-one tests against individual CLECs (Tier I) and in aggregate testing against all the CLECs (Tier II). The tables for the Tier I testing present the number of tests that were performed and the quartiles and extremes of the resulting BCVs. The tables for the Tier II testing present the single BCV which results from the aggregate test for the particular measure.

The mean measure parameter assignment of $\delta = 1$ for Tier I, and $\delta = 0.5$ for Tier II, corresponds to BellSouth's has proposal for mean measures. BellSouth has not made a proposal for the parameter values for proportions or rates, but we have chosen values so that results could be analyzed.

Summary of Balancing Critical Values for Mean Performance Measures

June-99

BellSouth compared to Individual CLECs (Tier I)
Distributional Statistics

OCI

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	4	-0.181417	-0.1451	-0.109	-0.1089	-0.10886
	Error Prob. ($\alpha = \beta$)		0.428	0.442	0.457	0.457	0.457
Non-Designed	Critical Value	33	-2.296208	-0.4909	-0.366	-0.1892	-0.105047
	Error Prob. ($\alpha = \beta$)		0.011	0.312	0.357	0.425	0.458

MAD

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	10	-0.718735	-0.4368	-0.292	-0.1098	-0.109787
	Error Prob. ($\alpha = \beta$)		0.236	0.331	0.385	0.456	0.456
Non-Designed	Critical Value	38	-3.232542	-1.1616	-0.555	-0.33	-0.102575
	Error Prob. ($\alpha = \beta$)		0.001	0.123	0.289	0.371	0.459

Both Measures Together

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	14	-0.718735	-0.371	-0.201	-0.1098	-0.10886
	Error Prob. ($\alpha = \beta$)		0.236	0.355	0.420	0.456	0.457
Non-Designed	Critical Value	71	-3.232542	-0.7232	-0.454	-0.28	-0.102575
	Error Prob. ($\alpha = \beta$)		0.001	0.235	0.325	0.390	0.459
Both Designed and Non-Designe	Critical Value	85	-3.232542	-0.6347	-0.404	-0.2148	-0.102575
	Error Prob. ($\alpha = \beta$)		0.001	0.263	0.343	0.415	0.459

Table of δ values for classes

DESIGN	DISP	RESIDENCE	δ
Design	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25
NonDesign	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25

Note: The column labelled 'N' indicates the number of tests performed.

BellSouth compared to ALL CLECs (Tier II)

OCI

		N_BST	N_CLEC	BCV
Designed	Critical Value	156	6	-0.2618
	Error Prob. ($\alpha = \beta$)			0.397
Non-Designed	Critical Value	10119	1191	-3.5174
	Error Prob. ($\alpha = \beta$)			0.000

MAD

		N_BST	N_CLEC	BCV
Designed	Critical Value	3409	106	-1.2327
	Error Prob. ($\alpha = \beta$)			0.109
Non-Designed	Critical Value	84715	3410	-6.5144
	Error Prob. ($\alpha = \beta$)			0.000

Table of δ values for classes

DESIGN	DISP	RESIDENCE	δ
Design	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25
NonDesign	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25

Summary of Balancing Critical Values for Proportional Performance Measures

June-99

BellSouth compared to Individual CLECs (Tier I)
Distributional Statistics

PMI

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	12	-0.57901	-0.4405	-0.3358	-0.2482	-0.1149997
	Error Prob. ($\alpha = \beta$)		0.281	0.330	0.369	0.402	0.454
Non-Designed	Critical Value	44	-6.64252	-1.94353	-1.5106	-0.8355	-0.2070812
	Error Prob. ($\alpha = \beta$)		0.000	0.026	0.065	0.202	0.418

PMR

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	8	-0.62257	-0.47305	-0.3842	-0.2919	-0.2233024
	Error Prob. ($\alpha = \beta$)		0.267	0.318	0.350	0.385	0.412
Non-Designed	Critical Value	37	-5.27166	-2.21036	-1.1329	-0.7336	-0.2094636
	Error Prob. ($\alpha = \beta$)		0.000	0.014	0.129	0.232	0.417

Both Measures Together

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	20	-0.62257	-0.45704	-0.3672	-0.2577	-0.1149997
	Error Prob. ($\alpha = \beta$)		0.267	0.324	0.357	0.398	0.454
Non-Designed	Critical Value	81	-6.64252	-1.9913	-1.2872	-0.7411	-0.2070812
	$= \beta$)		0.000	0.023	0.099	0.229	0.418
Both Designed and Non-Designed	Critical Value	101	-6.64252	-1.65503	-1.0278	-0.4697	-0.1149997
	Error Prob. ($\alpha = \beta$)		0.000	0.049	0.152	0.319	0.454

Table of ψ values for classes

DESIGN	DISP	RESIDENCE	ψ
Design	Dispatch	Residence	3
		Business	3
	Non-Disp	Residence	3
		Business	3
NonDesign	Dispatch	Residence	3
		Business	3
	Non-Disp	Residence	3
		Business	3

Note: The column labelled 'N' indicates the number of tests performed.

BellSouth compared to ALL CLECs (Tier II)

PMI

		N_BST	N_CLEC	BCV
Designed	Critical Value	836	54	-0.36738
	Error Prob. ($\alpha = \beta$)			0.357
Non-Designed	Critical Value	316505	20304	-3.76027
	Error Prob. ($\alpha = \beta$)			0.000

PMR

		N_BST	N_CLEC	BCV
Designed	Critical Value	2068	72	-0.27869
	Error Prob. ($\alpha = \beta$)			0.390
Non-Designed	Critical Value	62849	2301	-3.31819
	Error Prob. ($\alpha = \beta$)			0.000

Table of ψ values for classes

DESIGN	DISP	RESIDENCE	ψ
Design	Dispatch	Residence	1.5
		Business	1.5
	Non-Disp	Residence	1.5
		Business	1.5
NonDesign	Dispatch	Residence	1.5
		Business	1.5
	Non-Disp	Residence	1.5
		Business	1.5

Summary of Balancing Critical Values for Mean Performance Measures

September-99

BellSouth compared to Individual CLECs (Tier I)
Distributional Statistics

OCI

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	2	-0.384262	-0.3843	-0.247	-0.1091	-0.109091
	Error Prob. (α = β)		0.350	0.350	0.403	0.457	0.457
Non-Designed	Critical Value	38	-2.345302	-0.505	-0.356	-0.2563	-0.101499
	Error Prob. (α = β)		0.010	0.307	0.361	0.399	0.460

MAD

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	11	-0.556528	-0.249	-0.155	-0.1098	-0.109786
	Error Prob. (α = β)		0.289	0.402	0.438	0.456	0.456
Non-Designed	Critical Value	41	-3.535131	-0.8535	-0.549	-0.4217	-0.107731
	Error Prob. (α = β)		0.000	0.197	0.291	0.337	0.457

Both Measures Together

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	13	-0.556528	-0.249	-0.155	-0.1098	-0.109091
	Error Prob. (α = β)		0.289	0.402	0.438	0.456	0.457
Non-Designed	Critical Value	79	-3.535131	-0.686	-0.448	-0.2654	-0.101499
	Error Prob. (α = β)		0.000	0.246	0.327	0.395	0.460
Both Designed and Non-Designed	Critical Value	92	-3.535131	-0.6483	-0.423	-0.2485	-0.101499
	Error Prob. (α = β)		0.000	0.258	0.336	0.402	0.460

Table of δ values for classes

DESIGN	DISP	RESIDENCE	δ
Design	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25
NonDesign	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25

Note: The column labelled 'N' indicates the number of tests performed.

BellSouth compared to ALL CLECs (Tier II)

OCI

		N_BST	N_CLEC	BCV
Designed	Critical Value	88	14	-0.398
	Error Prob. (α = β)			0.345
Non-Designed	Critical Value	10811	1278	-3.6547
	Error Prob. (α = β)			0.000

MAD

		N_BST	N_CLEC	BCV
Designed	Critical Value	3597	51	-0.8299
	Error Prob. (α = β)			0.203
Non-Designed	Critical Value	76745	3349	-6.4213
	Error Prob. (α = β)			0.000

Table of δ values for classes

DESIGN	DISP	RESIDENCE	δ
Design	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25
NonDesign	Dispatch	Residence	0.25
		Business	0.25
	Non-Disp	Residence	0.25
		Business	0.25

Summary of Balancing Critical Values for Proportional Performance Measures

September-99

BellSouth compared to Individual CLECs (Tier I)
Distributional Statistics

PMI

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	14	-0.618824	-0.3079	-0.232	-0.1642	-0.048511
	Error Prob. ($\alpha = \beta$)		0.268	0.379	0.408	0.435	0.481
Non-Designed	Critical Value	47	-4.34262	-1.2998	-0.957	-0.6438	-0.134341
	Error Prob. ($\alpha = \beta$)		0.000	0.097	0.169	0.260	0.447

PMR

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	8	-0.342068	-0.21	-0.175	-0.144	-0.143989
	Error Prob. ($\alpha = \beta$)		0.366	0.417	0.431	0.443	0.443
Non-Designed	Critical Value	40	-3.474092	-1.0586	-0.689	-0.5493	-0.176512
	Error Prob. ($\alpha = \beta$)		0.000	0.145	0.245	0.291	0.430

Both Measures Together

		N	MIN	Q1	MED	Q3	MAX
Designed	Critical Value	22	-0.618824	-0.2725	-0.214	-0.144	-0.048511
	Error Prob. ($\alpha = \beta$)		0.268	0.393	0.415	0.443	0.481
Non-Designed	Critical Value	87	-4.34262	-1.2191	-0.783	-0.5511	-0.134341
	Error Prob. ($\alpha = \beta$)		0.000	0.111	0.217	0.291	0.447
Both Designed and Non-Designed	Critical Value	109	-4.34262	-1.1086	-0.683	-0.3421	-0.048511
	Error Prob. ($\alpha = \beta$)		0.000	0.134	0.247	0.366	0.481

Table of δ values for classes

DESIGN	DISP	RESIDENCE	ψ
Design	Dispatch	Residence	2
		Business	2
	Non-Disp	Residence	2
		Business	2
NonDesign	Dispatch	Residence	2
		Business	2
	Non-Disp	Residence	2
		Business	2

Note: The column labelled 'N' indicates the number of tests performed.

BellSouth compared to ALL CLECs (Tier II)

PMI

		N_BST	N_CLEC	BCV
Designed	Critical Value	476	73	-0.9917
	Error Prob. ($\alpha = \beta$)			0.161
Non-Designed	Critical Value	244744	18482	-7.0168
	Error Prob. ($\alpha = \beta$)			0.000

PMR

		N_BST	N_CLEC	BCV
Designed	Critical Value	2119	33	-0.3865
	Error Prob. ($\alpha = \beta$)			0.350
Non-Designed	Critical Value	59369	2405	-5.9365
	Error Prob. ($\alpha = \beta$)			0.000

Table of δ values for classes

DESIGN	DISP	RESIDENCE	ψ
Design	Dispatch	Residence	2
		Business	2
	Non-Disp	Residence	2
		Business	2
NonDesign	Dispatch	Residence	2
		Business	2
	Non-Disp	Residence	2
		Business	2

REMEDY PROPOSAL REVIEW

Presentation February 7, 2000

VSEEM III OBJECTIVES

- BASED ON KEY OUTCOME MEASURES SERVICE LEVELS AND MOE
- INCENTIVE FOR POST-271 COMPLIANT PERFORMANCE
  - Escalate with Magnitude of Failure
  - Escalate with Repeat Failures
- ADDRESS INDIVIDUAL CLECS AND CLEC INDUSTRY
- USE OF SOUND STATISTICAL PROCEDURES as Key Input
- SWIFT AND SELF-EXECUTING
- RELATIVELY SIMPLE TO IMPLEMENT AND MONITOR
- STRUCTURED SO THAT CLECS WILL NOT PREFER REMEDY PAYMENT OVER QUALITY SERVICE

VSEEM III

- BASED ON KEY OUTCOME MEASURES
  - DOJ review of BA Application focused on the "Critical" measurement set
  - TX PUC review of SWBT Application focused on the "High" category measures
  - SQM Measures (non-VSEEMIII) are for Monitoring purposes
- Modes of Entry are addresses for Resellers and Facility-based providers
  - Resale POTS
  - Resale Design
  - UNE Loop and Port Combinations
  - UNE Loops
  - IC Trunks
  - Collocation

VSEEMIII
Multi-Tiered

- Tier 1 (Liquidated Damages)
  - Monthly Assessment at State Level for Individual CLEC
    - State level evaluation is consistent with overall test statistic
    - State level evaluation takes 'random variation' into consideration
    - State level evaluation will not mask discrimination
  - Parity gap will result in payment to the CLEC operating in negative like-to-like cells (wire center/service)
- Tier 2 (Fines Paid to State)
  - Triggered by three consecutive failures in a quarter
  - Assessed Quarterly at State Level for CLEC Aggregate
- Tier 3 (suspension of LD authority)
  - Selected sub-measures (12) at the state level.
  - Triggered by repeated failures of the same 5 or more sub-measures for a quarter.

INCENTIVES FOR COMPLIANCE

- ESCALATING REMEDIES
  - Magnitude of Failure
    - Addressed utilizing the z-value and balancing critical value. The further z deviates from the balancing critical value, the more BST pays.
    - For benchmark measures, the further away BST is from the defined benchmark, the more BST pays
  - Repeat Failures
    - VSEEMIII fee schedule increases month-over-month

VSEEM III
Statistical Procedures

- Key INPUT into BST VSEEMIII Remedy Plan
- Addresses and Solves the following issues:
  - Deep Disaggregation
  - Random Variation
  - Masking Discrimination
  - Type I and Type II Error Balancing

BSTs method of using the Statistical Results as Key Input into the VSEEMIII plan renders the plan swift, simple and fairly easy to implement

AT&T and MCI Proposals
Statistics and Remedy Plans

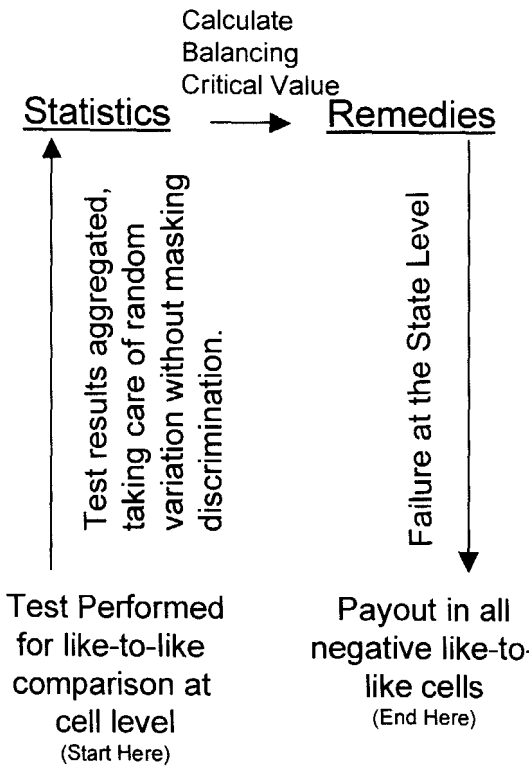
- Use Statistical Tests that is dependent on Disaggregate Reporting
  - Driving CLECs to request 'more and more' disaggregation
- Structure Remedy Plans to address
  - Random Variation
  - Type I and Type II Error Balancing

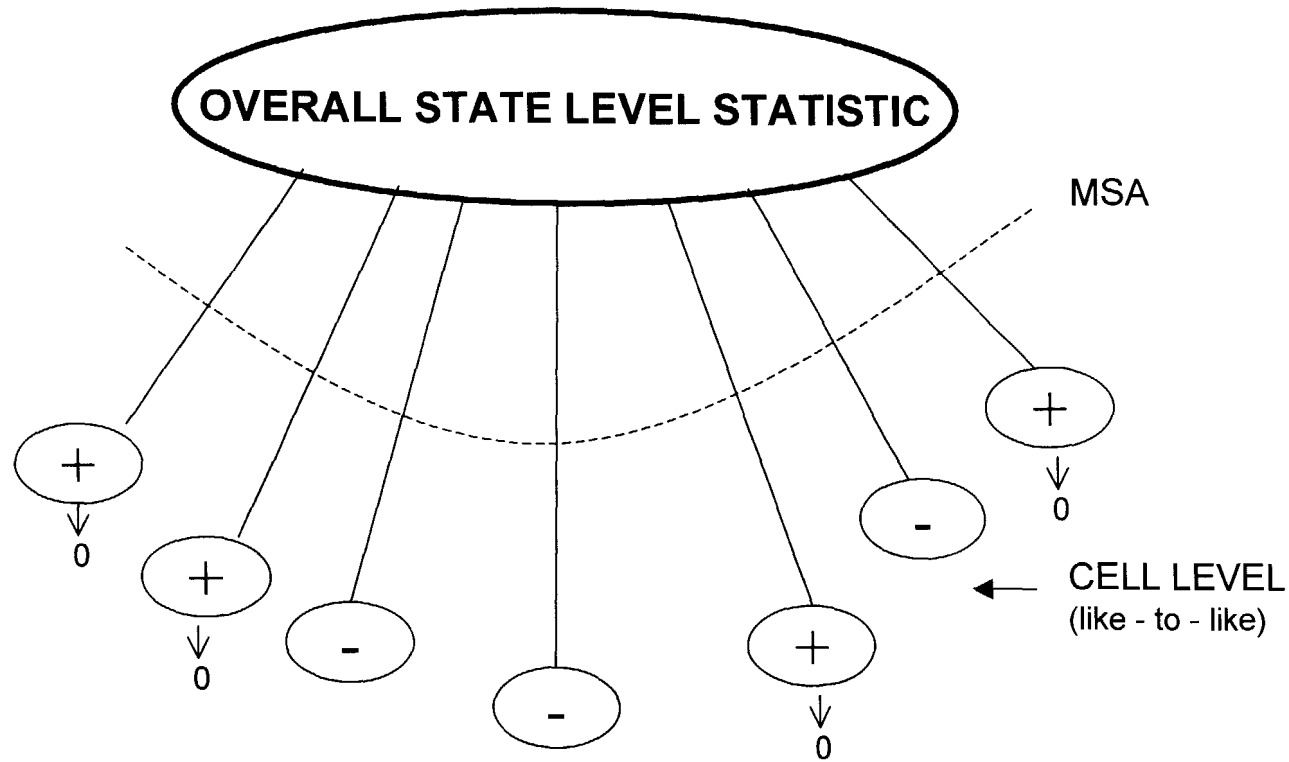
AT&T and MCI Remedy Plans are relatively complicated, with many decision points. Primarily because of the need to solve key issues, such as Random Variation and TypeI/TypeII Errors in their Remedy Plans

VSEEM III

- BST Decision Points (Tier-1)
  - Determine Pass/Fail Status; looking a statistical results or benchmark
  - What was the magnitude of the failure
  - On how many transactions do we pay
  - Determine if this is the first or a repeat failure
  - Render Payment

Remedy Payout Diagram
(for Retail Analogues)





Legend: + = Performance favored CLEC
- = Performance favored BST

VSEEMIII
Benchmark Measurements

- Two Types of Benchmarks
  - Those in the form of a target; 95% within "x"
  - Those in the form of a proportion

- A miss of a Target benchmark results in payout to 100%
  - For example:

    Monthly CLEC result is 93% within "X", target is 95% within "X"

    Payout will be on 100% -93%, yielding 7% of the transactions

- A miss of a proportions results in a payout of actual performance against the proportional benchmark
  - For example:

    Monthly CLEC result is 12% Missed Appointments, benchmark is 9%

    Payout will be on 12%-9%, yielding 3% of the transactions

Benchmarks and Small Sample Sizes

BST supports the CLECs concept that adjustments be made for Small Sample Sizes

Table I **Small Sample Size Table (95% Confidence)**

Sample Size	Equivalent 90% Benchmark	Equivalent 95% Benchmark
5	60.00%	80.00%
6	66.67%	83.33%
7	71.43%	85.71%
8	75.00%	75.00%
9	66.67%	77.78%
10	70.00%	80.00%
11	72.73%	81.82%
12	75.00%	83.33%
13	76.92%	84.62%
14	78.57%	85.71%
15	73.33%	86.67%

Sample Size	Equivalent 90% Benchmark	Equivalent 95% Benchmark
16	75.00%	87.50%
17	76.47%	82.35%
18	77.78%	83.33%
19	78.95%	84.21%
20	80.00%	85.00%
21	76.19%	85.71%
22	77.27%	86.36%
23	78.26%	86.96%
24	79.17%	87.50%
25	80.00%	88.00%
26	80.77%	88.46%
27	81.48%	88.89%
28	78.57%	89.29%
29	79.31%	86.21%
30	80.00%	86.67%

PROPOSAL SUMMARY

- CLEC proposals are complex and cumbersome in an attempt to correct for the flaws in the discrimination detection tool they support; namely, the Modified-Z test.

- BST has opted to support a statistical methodology that
  - Compares "like-to-like" at the deepest level
  - Accounts for random variation
  - Doesn't mask discrimination at the deepest level of comparison
  - Balances Type I and Type II Error, allowing a natural fit for capturing the magnitude of the failure

The Statistics make BSTs Remedy Proposal relatively simple to implement and monitor

Bellsouth Voluntary Self-Effectuating Enforcement Mechanism (VSEEM) plan is comprehensively crafted based on the following principles:

- Inclusion of key, outcome oriented measures
- Designed to prevent BST "backsliding" on CLEC service
  - Comprehensive plan that is "Meaningful" and "Significant"
  - Monetary remedies escalate with the magnitude of failure
  - Monetary remedies escalate with the duration of the failure
  - Non-monetary consequences are incorporated in the plan
- Addresses all CLECs in operation; large and small
- Addresses the CLEC Industry
- Uses sound statistical procedures
  - Compares "like-to-like" with deep disaggregation
  - Solves the problem of 'random variation'
  - Procedures do not 'mask discrimination'
  - Methodology for balancing Type I and Type II Errors
- Structured such that CLECs will not prefer Remedies over Quality Service
- Minimize opportunities for 'Gaming'
- Swift and Self-Executing
  - Interest paid on remedy rendered for each date past due
- Not applied until after 271 approval in a specific state
- Fairly simple to implement and monitor

VSEEM MEASUREMENTS

The measurement set included in the VSEEM plan are key, outcome oriented measures. A description of each measure can be found in Exhibit B.

The modes of entry (MOE) are addressed for Resellers and Facilities-based providers; with the following product groupings: Resale POTS, Resale Design, UNE Loop and Port Combinations, UNE Loops, IC Trunks and Collocation.

STATISTICAL TESTING

Bellsouth supports the use of the Truncated-Z test and Balancing Critical Value to determine parity of service. The statistical test adopted by Bellsouth solves many problems that the CLECs and other ILECs correct for in their remedy plans. A detailed description of the statistical procedures can be found in Exhibit C.

Disaggregation

The primary purpose of disaggregate reporting is to get a "like-to-like" for comparative analysis. Bellsouth solves the problem of "like-to-like" in its cell level grouping and statistical testing. "Like-to-like" ensures testing is going on for those CLECs with a business plan targeted at a specific market. Deep disaggregation during the statistical procedure alleviates the need for multiple, unnecessary report production as proposed by many CLECs. (See Exhibit C)

Random Variation

The issue of random variation is solved when generating an Overall Test Statistic for a particular measure. This process is further described in Exhibit C. Bellsouth does not have to correct for this in the remedy plan because it has been solved in the statistical procedure.

Masking Discrimination

The process of truncating positive z-scores to zero solves the problem of masking discrimination.

Type I and Type II Error Balancing

Parity is determined by comparing the results of the statistical test to a critical value. This critical value may be fixed or dynamic. A fixed critical value suggests a controlled experiment is underway; either predetermining the sample or assuming the sample remains static month over month. This suggest that Bellsouth and the CLEC will always have the same number of transactions, therefore stabilizing the probability that Bellsouth is failing when it is not, and the probability that Bellsouth is not failing when it is. Recognizing this is not so, Bellsouth has adopted a methodology to balance the critical value using current month performance results. See Exhibit C.

In summary, Bellsouth does not support the use of a "defacto balance point" as proposed by some of the CLECs, but rather a sound statistical approach to balancing based on the varying monthly data/activity.

VSEEM Structure

Bellsouth offers a tiered approach to remedies, with each tier operating independently. Tier-1 addresses the individual CLEC, Tier-2 and Tier-3 address the CLEC industry.

Tier-1 for Retail Analogues

Tier-1 enforcement mechanisms are triggered when Bellsouth fails on any one of the Tier-1 VSEEM measurements for a particular month, and paid directly to an individual CLEC. See Exhibit B for a list of Tier-1 submetrics.

The decision point (regarding the pass or fail status of a measure) is determined by the individual CLEC results of the overall test statistic and balancing critical value when parity is the standard. This decision is made at a point where "like-to-likes" are being compared, random variation has been considered, problems around masking discrimination have been solved, and the probability of Type I and Type II errors are accounted for.

If it is decided that a failure occurred, Bellsouth will pay in those "like-to-like" areas where potential discrimination was detected, based on the magnitude and duration of the failure.

The magnitude of the failure is defined by the departure of the overall test statistic from the balancing critical value; also stated as the Parity Gap. The overall test statistic and balancing critical value are further described in Exhibit C. The magnitude is incremental, maxing out at a parity gap of '4', wherein the CLEC will be paid on 100% of all transactions in that "like-to-like" area.

Failures that occur month-over-month will result in an escalation of the dollar value per transaction, up to month six. Failures that persist after the sixth month will be subject to the dollar amount available at month six. The fee schedule is shown in Exhibit E.

Tier-2 for Retail Analogues

Tier-2 enforcement mechanisms are triggered by three consecutive monthly failures in a quarter for the CLEC Aggregate. These payments are paid directly to the State Commission or designated agency. See Exhibit B for a list of Tier-2 submetrics.

The decision point (regarding the pass or fail status of a measure) is determined by the CLEC Aggregate results of the overall test statistic and balancing critical value when parity is the standard. This decision is made at a point where "like-to-likes" are being compared, random variation has been considered, problems around masking discrimination have been solved, and the probability of Type I and Type II errors are accounted for.

If it is decided that an industry failure occurred, Bellsouth will pay in those "like-to-like" areas where potential discrimination was detected, based on the magnitude of the failure.

The magnitude of the failure is defined by the departure of the overall test statistic from the balancing critical value; also stated as the Parity Gap. The overall test statistic and balancing critical value are further described in Exhibit C. The magnitude is incremental, maxing out at a parity gap of '4', wherein the CLEC will be paid on 100% of all transactions in that "like-to-like" area.

Tier-3 for Retail Analogues

Tier-3 enforcement mechanisms are triggered when Bellsouth consistently fails at the CLEC Aggregate level on any five of the Tier-3 VSEEM measurements in a calendar quarter. Tier-3 consequences are non-monetary, wherein Bellsouth is offering to discontinue marketing of Long Distance in that particular state. See Exhibit B for a list of Tier-3 submetrics.

The decision point (regarding the pass or fail status of a measure) is determined by the CLEC Aggregate results of the overall test statistic and balancing critical value when parity is the standard. This decision is made at a point where "like-to-likes" are being compared, random variation has been considered, problems around masking discrimination have been solved, and the probability of Type I and Type II errors are accounted for.

If it is decided that an industry failure occurred, Bellsouth will discontinue long distance marketing in the harmed state. Bellsouth may begin marketing long distance when two of the five failed submetrics show favorable results for two consecutive months in the following quarter.

Tier-1, Tier-2 and Tier-3 for Benchmark Measurements

Benchmarks have been established for those processes or services for which no retail analogue exists. A minimum activity level is required for benchmark measurement payout; i.e., activity levels less than 5 will not be considered for benchmark remedies. There a two types of benchmarks in the VSEEM III SQM; those in the form of a target, and proportions. The proposed benchmarks are shown in Exhibit B.

The decision point (regarding pass or fail) is determined by the individual CLEC results compared to the established benchmark (Tier-1), and the CLEC Aggregate results compared to the established benchmark (Tiers –2 and –3).

If a failure is detected, Bellsouth will pay on those transactions that exceed the threshold.

The magnitude of the failure is captured in the gap between the actual performance result and the benchmark.

Bellsouth supports AT&Ts solution to handling small sample sizes using benchmark adjustments. However, Bellsouth supports a 95% confidence bound. Table I shows adjustments for CLEC Activity ranging from 5 to 30.

Table I **Small Sample Size Table (95% Confidence)**

Sample Size	Equivalent 90% Benchmark	Equivalent 95% Benchmark
5	60.00%	80.00%
6	66.67%	83.33%
7	71.43%	85.71%
8	75.00%	75.00%
9	66.67%	77.78%
10	70.00%	80.00%
11	72.73%	81.82%
12	75.00%	83.33%
13	76.92%	84.62%
14	78.57%	85.71%
15	73.33%	86.67%

Sample Size	Equivalent 90% Benchmark	Equivalent 95% Benchmark
16	75.00%	87.50%
17	76.47%	82.35%
18	77.78%	83.33%
19	78.95%	84.21%
20	80.00%	85.00%
21	76.19%	85.71%
22	77.27%	86.36%
23	78.26%	86.96%
24	79.17%	87.50%
25	80.00%	88.00%
26	80.77%	88.46%
27	81.48%	88.89%
28	78.57%	89.29%
29	79.31%	86.21%
30	80.00%	86.67%

VSEEM Calculations

Step-by-step procedures for calculating remedy payouts for both standards (parity and benchmarks) can be found in Exhibit D.

VSEEM Monetary Caps

Bellsouth is offering to place $625M dollars at risk for the nine state region. The distribution is shown in the table below:

AL - $54M	**MS - $44M**
FL - $122M	**NC - $77M**
GA - $131M	**SC - $47M**
KY - $34M	**TN - $57M**
LA - $59M	
Regional Total - $625M	

VSEEMIII TIER-1 SUBMETRICS

- FOC Timeliness (Mechanized only)
- Reject Interval (Mechanized only)
- Order Completion Interval (Dispatch only) – Resale POTS
- Order Completion Interval (Dispatch only) – Resale Design
- Order Completion Interval (No Dispatch only) – UNE Loop and Port Combos
- Order Completion Interval ('w' code orders, Dispatch only) – UNE Loops
- Order Completion Interval (Dispatch only) – IC Trunks
- Percent Missed Installation Appointments – Resale POTS
- Percent Missed Installation Appointments – Resale Design
- Percent Missed Installation Appointments – UNE Loop and Port Combos
- Percent Missed Installation Appointments – UNE Loops
- Percent Provisioning Troubles within 4 Days - Resale POTS
- Percent Provisioning Troubles within 4 Days - Resale Design
- Percent Provisioning Troubles within 4 Days - UNE Loop and Port Combos
- Percent Provisioning Troubles within 4 Days - UNE Loops
- Customer Trouble Report Rate – Resale POTS
- Customer Trouble Report Rate – Resale Design
- Customer Trouble Report Rate - UNE Loop and Port Combos
- Customer Trouble Report Rate - UNE Loops
- Percent Missed Repair Appointments – Resale POTS
- Percent Missed Repair Appointments - Resale Design
- Percent Missed Repair Appointments - UNE Loop and Port Combos
- Percent Missed Repair Appointments - UNE Loops
- Maintenance Average Duration – Resale POTS
- Maintenance Average Duration – Resale Design
- Maintenance Average Duration - UNE Loop and Port Combos
- Maintenance Average Duration - UNE Loops
- Maintenance Average Duration – IC Trunks
- Percent Repeat Troubles within 30 Days – Resale POTS
- Percent Repeat Troubles within 30 Days – Resale Design
- Percent Repeat Troubles within 30 Days - UNE Loop and Port Combos
- Percent Repeat Troubles within 30 Days - UNE Loops
- Percent Trunk Blockage
- LNP Disconnect Timeliness
- LNP Percent Missed Installation Appointment
- Coordinated Customer Conversions for UNE Loops
- Coordinated Customer Conversions for LNP
- Percent Missed Collocation Due Dates

VSEEMIII TIER-2 SUBMETRICS

- Percent Response Received within "X" seconds – Pre-Order OSS
- OSS Interface Availability
- Order Process Percent Flow-Through (Mechanized only)
- Order Completion Interval (Dispatch only) – Resale POTS
- Order Completion Interval (Dispatch only) – Resale Design
- Order Completion Interval (No Dispatch only) – UNE Loop and Port Combos
- Order Completion Interval ('w' code orders, Dispatch only) – UNE Loops
- Order Completion Interval (Dispatch only) – IC Trunks
- Percent Missed Installation Appointments – Resale POTS
- Percent Missed Installation Appointments – Resale Design
- Percent Missed Installation Appointments – UNE Loop and Port Combos
- Percent Missed Installation Appointments – UNE Loops
- Percent Provisioning Troubles within 4 Days - Resale POTS
- Percent Provisioning Troubles within 4 Days - Resale Design
- Percent Provisioning Troubles within 4 Days - UNE Loop and Port Combos
- Percent Provisioning Troubles within 4 Days - UNE Loops
- Customer Trouble Report Rate – Resale POTS
- Customer Trouble Report Rate – Resale Design
- Customer Trouble Report Rate - UNE Loop and Port Combos
- Customer Trouble Report Rate - UNE Loops
- Percent Missed Repair Appointments – Resale POTS
- Percent Missed Repair Appointments - Resale Design
- Percent Missed Repair Appointments - UNE Loop and Port Combos
- Percent Missed Repair Appointments - UNE Loops
- Maintenance Average Duration – Resale POTS
- Maintenance Average Duration – Resale Design
- Maintenance Average Duration - UNE Loop and Port Combos
- Maintenance Average Duration - UNE Loops
- Maintenance Average Duration – IC Trunks
- Percent Repeat Troubles within 30 Days – Resale POTS
- Percent Repeat Troubles within 30 Days – Resale Design
- Percent Repeat Troubles within 30 Days - UNE Loop and Port Combos
- Percent Repeat Troubles within 30 Days - UNE Loops
- Billing Timeliness
- Billing Accuracy
- Usage Data Delivery Timeliness
- Usage Data Delivery Accuracy
- Percent Trunk Blockage
- LNP Disconnect Timeliness
- LNP Percent Missed Installation Appointment
- Coordinated Customer Conversions for UNE Loops
- Coordinated Customer Conversions for LNP
- Percent Missed Collocation Due Dates

VSEEMIII TIER-3 SUBMETRICS

- Percent Missed Installation Appointments – Resale POTS
- Percent Missed Installation Appointments – Resale Design
- Percent Missed Installation Appointments – UNE Loop and Port Combos
- Percent Missed Installation Appointments – UNE Loops
- Percent Missed Repair Appointments – Resale POTS
- Percent Missed Repair Appointments - Resale Design
- Percent Missed Repair Appointments - UNE Loop and Port Combos
- Percent Missed Repair Appointments - UNE Loops
- Billing Timeliness
- Billing Accuracy
- Percent Trunk Blockage
- Percent Missed Collocation Due Dates

VSEEM III	*MEASURES AND SUB-METRICS*	**Retail Analogue** Resale (x) and UNEs	**Benchmark**
Pre-Ordering	Percent Response Received within "X" seconds	Retail Analogue + 4 sec	
	OSS Interface Availability	x	
Ordering	Percent Flow-Through Service Request (Fully Mechanized only)		90%
	Firm Order Confirmation Timeliness (Mechanized only)		95% ≤ 4 hrs
	Reject Interval (Mechanized only)		95% ≤ 1 hrs
Provisioning	Order Completion Interval (Dispatch only) – Resale POTS	x	
	Order Completion Interval (Dispatch only) – Resale Design	x	
	Order Completion Interval (No Dispatch only) – UNE Loop & Port Combos	Retail Residence and Business	
	Order Completion Interval (Dispatch only) – UNE Loops	Design: Retail Design Dispatch 'w' Orders Non-Design: Retail Res, Bus Dispatch 'w' Orders	
	Order Completion Interval (Dispatch only) – IC Trunks	x	
	Percent Missed Installation Appointments – Resale POTS	x	
	Percent Missed Installation Appointments – Resale Design	x	
	Percent Missed Installation Appointments – UNE Loop and Port Combos	Retail Residence and Business	
	Percent Missed Installation Appointments – UNE Loops	Design: Retail Design [1] Non-Design: Retail Res, Bus [1]	
	Percent Provisioning Troubles within 4 Days - Resale POTS	x	
	Percent Provisioning Troubles within 4 Days - Resale Design	x	
	Percent Provisioning Troubles within 4 Days - UNE Loop and Port Combos	Retail Residence and Business	
	Percent Provisioning Troubles within 4 Days - UNE Loops	Design: Retail Design [1] Non-Design: Retail Res, Bus [1]	
Maintenance	Customer Trouble Report Rate – Resale POTS	x	
	Customer Trouble Report Rate – Resale Design	x	
	Customer Trouble Report Rate - UNE Loop and Port Combos	Retail Residence and Business	
	Customer Trouble Report Rate - UNE Loops	Design: Retail Design [1] Non-Design: Retail Res, Bus [1]	
	Percent Missed Repair Appointments – Resale POTS	x	
	Percent Missed Repair Appointments - Resale Design	x	
	Percent Missed Repair Appointments - UNE Loop and Port Combos	Retail Residence and Business	
	Percent Missed Repair Appointments - UNE Loops	Design: Retail Design [1] Non-Design: Retail Res, Bus [1]	

NOTES: [1] The retail analog for UNE Non-Design is the average of all retail residence and retail business transactions for the particular month. The retail analog for UNE Design is calculated similarly using retail residence, business and design results.
[2] UD = Under Development

Maintenance Continued	Maintenance Average Duration – Resale POTS	x	
	Maintenance Average Duration – Resale Design	x	
	Maintenance Average Duration - UNE Loop and Port Combos	Retail Residence and Business	
	Maintenance Average Duration - UNE Loops	Design: Retail Design [1] Non-Design: Retail Res, Bus [1]	
	Maintenance Average Duration – IC Trunks	x	
	Percent Repeat Troubles within 30 Days – Resale POTS	x	
	Percent Repeat Troubles within 30 Days – Resale Design	x	
	Percent Repeat Troubles within 30 Days - UNE Loop and Port Combos	Retail Residence and Business	
	Percent Repeat Troubles within 30 Days - UNE Loops	Design: Retail Design [1] Non-Design: Retail Res, Bus [1]	
Billing	Invoice Accuracy	x	
	Mean Time To Deliver Invoices	x	
	Usage Data Delivery Accuracy	x	
	Usage Data Delivery Timeliness	x	
Trunk Blockage	Trunk Group Service Report (Percent Trunk Blockage)	x	
LNP	Average Disconnect Timeliness Interval		UD [2]
	Percent Missed Installation Appointments		UD [2]
CC Conversions	Coordinated Customer Conversions – UNE Loop		95% ≤ 15min
	Coordinated Customer Conversions – LNP		95% ≤ 15 min
Collocation	% of Due Dates Missed		≤ 10%

NOTES: [1] The retail analog for UNE Non-Design is the average of all retail residence and retail business transactions for the particular month. The retail analog for UNE Design is calculated similarly using retail residence, business and design results.
[2] UD = Under Development

ENFORCEMENT MEASUREMENTS
TABLE OF CONTENTS

* These reports are subject to change due to regulatory requirements, corrections, clarifications, etc.

PRE-ORDERING - OSS

Report/Measurement :	
Percent Response Received within 'X" seconds	
Definition:	
Proportion of requests responded to within "X" seconds for accessing legacy data associated with appointment scheduling, service & feature availability, address verification, request for Telephone Numbers (TNs), and Customer Service Records (CSRs).	
Exclusions:	
None	
Business Rules:	
The response interval starts when the client application (LENS or TAG for CLECs and RNS for BST) submits a request to the legacy system and ends when the appropriate response is returned to the client application. The number of legacy accesses during the reporting period which take less than "X" seconds are captured.	
Level of Disaggregation:	
• Region	
Calculation:	
Σ[(Date & Time of Legacy Response) – (Date & Time of Request to Legacy)] / (Number of Legacy Requests During the Reporting Period) X 100	
Report Structure:	
• CLEC Aggregate • BST Aggregate	
Data Retained Relating to CLEC Experience:	**Data Retained Relating to BST Performance:**
• Report Month • Response Interval • Regional Scope	• Report Month • Response Interval • Regional Scope
Retail Analog/Benchmark	
Retail Analog Plus 4 seconds	

PRE-ORDERING

Report/Measurement:	
OSS Interface Availability	
Definition:	
Percent of time OSS interface is functionally available compared to scheduled availability. Availability percentages for CLEC interface systems and for all Legacy systems accessed by them are captured	
Exclusions:	
None	
Business Rules:	
This measurement captures the availability percentages for the BST systems, which are used by CLECs during Pre-Ordering functions. Comparison to BST results allow conclusions as to whether an equal opportunity exists for the CLEC to deliver a comparable customer experience.	
Level of Disaggregation:	
• Region	
Calculation:	
(Functional Availability) / (Scheduled Availability) X 100	
Report Structure:	
• CLEC Aggregate • BST Aggregate	
Data Retained Relating to CLEC Experience	**Data Retained Relating to BST Experience**
• Report Month • Regional Scope	• Report Month • Regional Scope
Retail Analog/Benchmark:	
Retail Analog	

ORDERING

Report/Measurement:
Percent Flow Through Service Requests (Summary)
Definition:
The percentage of Local Service Requests (LSR) submitted electronically via the CLEC mechanized ordering process that flow through to SOCS without manual intervention
Exclusions:
• Fatal Rejects • Auto Clarification • Manual Fallout • CLEC System Fallout • Supplements (Subsequent versions) to cancel LSRs that are not LESOG eligible (under development)
Business Rules:
The CLEC mechanized ordering process includes all LSRs, including supplements which are submitted through one of the three gateway interfaces (TAG, EDI, and LENS), and flow through to SOCS without manual intervention. The CLEC mechanized ordering process does not include LSRs, which are, submitted manually (e.g., fax, and courier), or are not designed to flow through, i.e., Manual Fallout. **Definitions:** **Fatal Rejects:** Errors that prevent an LSR, submitted by the CLEC, from being processed further. When an LSR is submitted by a CLEC, LEO will perform edit checks to ensure the data received is correctly formatted and complete. For example, if the PON field contains an invalid character, LEO will reject the LSR and the CLEC will receive a Fatal Reject. **Auto-Clarification**: errors that occur due to invalid data within the LSR. LESOG will perform data validity checks to ensure the data within the LSR is correct and valid. For example, if the address on the LSR is not valid according to RSAG, the CLEC will receive an Auto-Clarification. **Manual Fallout**: errors that occur by design. Certain LSRs are designed to fallout of the Mechanized Order Process due to their complexity. These LSRs are manually processed by the LCSC. When a CLEC submits an LSR, LESOG will determine if the LSR should be forwarded to LCSC for manual handling. Following are the categories for Manual Fallout. 1. Complex services* 2. Expedites (requested by the CLEC) 3. Special pricing plans 4. Denials-restore and conversion, or disconnect and conversion orders 5. Partial migrations 6. Class of service invalid in certain states with some types of service 7. New telephone number not yet posted to BOCRIS 8. Low volume such as activity type "T" (move) 9. Pending order review required 10. More than 25 business lines 11. Restore or suspend for UNE combos 12. Transfer of calls option for the CLEC's end users 13. CSR inaccuracies such as invalid or missing CSR data in CRIS * Attached is a list of services, including complex services, and whether LSRs issued for the services are eligible to flow through. **Total System Fallout:** Errors that require manual review by the LCSC to determine if the error is caused by the CLEC, or is due to system functionality. If it is determined the error is caused by the CLEC, the LSR will be sent back to the CLEC as clarification. If it is determined the error is BST caused, the LCSC representative will correct the error.

ORDERING – (Percent Flow Through Service Requests (Summary) – Continued)

Calculation:	
Percent Flow Through = (The total number of LSRs that flow through LESOG to SOCS) / (the number of LSRs passed from LEO to LESOG) – Σ[(the number of LSRs that fall out for manual processing) + (the number of LSRs that are returned to the CLEC for clarification) + (the number of LSRs that contain errors made by CLECs)] X 100.	
Report Structure:	
• CLEC Aggregate	
Level of Disaggregation:	
• Region	
Data Retained Relating to CLEC Experience	**Data Retained Relating to BST Experience**
• Report month ➢ Total number of LSRs received • Total number of errors by type: ➢ Fatal rejects ➢ Total fallout for manual processing ➢ Auto clarification ➢ CLEC caused system fallout • Total number of errors by error code	
Retail Analog/Benchmark:	
Benchmark	